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[54] **METHOD FOR FINE DECOMPOSITION IN FINITE ELEMENT MESH GENERATION**

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[58] **Field of Search** 364/300, 505, 522, 578, 364/505; 382/25, 26

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[57] **ABSTRACT**

A method for fine decomposition in finite element mesh generation, in which a polygonal boundary of a domain is input into the system by an analyst and the domain is automatically divided into rough elements generally corresponding to Voronoi regions, that is, regions which are closer to respective ones of the polygonal line segments or reflex vertices therebetween. Any arc portion of these regions is converted to a straight line. Additional lines are formed between interior vertices of the rough regions so that all rough regions are either triangles or trapezoids. Adjacent rough regions are then paired across internal boundaries and are classified into four types. The rough regions are then subdivided into fine regions of triangular shape according to rules associated with each of the four types. The degree of fine subdivision can be controlled according to known equations providing the total number of fine elements. Finite difference equations are solved on the so generated fine regions and a physical variable is displayed in pictorial form. The analyst then readjusts the domain boundary and repeats the process.

16 Claims, 7 Drawing Sheets